

20/PTS

10/532735

DT01 Rec'd PCT/PTC 25 APR 2005

SPECIFICATION

ELECTRON ACCELERATOR AND

RADIATION MEDICAL TREATMENT APPARATUS USING THE SAME

This application is a 371 of PCT/JP03/13656 10/24/2003

Technical Field

[0001] The present invention relates to an electron accelerator and radiation medical treatment apparatus using the same, generating electron beam of the energy of several to higher than ten MeV, by fixed-field alternating gradient.

Background Art

[0002] As a radiation medical treatment apparatus for cancer and others using electron beam and X-ray generated therefrom in Prior Art Example 1, a linear accelerator (LINAC) is mainly used at present in which electron is accelerated to the energy of several to higher than ten MeV for example, the in the Japanese Laid-Open Publication (JP H10-64700A (1998), p.4, Fig.1). Also as a linear accelerator, a microtron electron accelerator is known for example, in the Japanese Laid-Open Publication (JP H07-169600A (1995) pp.2 - 3, Figs.1 and 2).

[0003] Fig. 20 illustrates an example of makeup of a medical treatment linear accelerator of Prior Art Example 1. The medical treatment linear accelerator 100 comprises an electron gun 101, an accelerating device 102, and a magnetic bending apparatus 103 provided outside of an accelerating device 102. The electron input into the accelerating device 102 by the electron gun 101 is accelerated along the beam axis of the accelerating device 102. The accelerating device 102 is made up of a microwave cavity for acceleration, and connected to a microwave oscillator 104 and its control circuit 105. The microwave oscillator 104 generates the electromagnetic field in the accelerating cavity of the accelerating device 102. When an electron passes the accelerating cavity of the accelerating device 102, it is focused by electromagnetic field of microwave, and is accelerated. The thus accelerated electron beam 106 is irradiated from an output window 107 to become an output electron beam 108, and used for radiation medical treatment.

[0004] The orbital of said output electron beam 108 is changed by the